REMARKS

Claims 1, 19, 21, and 27 have been amended. Support for the amendments made to claims 1, 19, 21, and 27 may be found throughout the specification and figures. No new matter has been added. Claims 28 and 29 have been cancelled without disclaimer of the subject matter contained therein or prejudice to Applicant's right to file any continuations directed thereto. Upon entry of this Amendment, claims 1-27 remain pending.

In the Office Action dated May 9, 2006, claims 28 and 29 were objected to under 35 U.S.C. §112, ¶4 as being improper dependent claims because they do not further limit claims 1 and 21, respectively. Applicants have cancelled claims 28 and 29, thereby mooting the objection thereto.

In the Office Action, claims 1-7, 9-22, 24, and 26-29 were rejected under 35 U.S.C. §102(e) as being anticipated by Koster et al. (U.S. Patent No. 6,614,505). Applicant respectfully traverses this rejection.

Independent claim 1 recites a lithographic projection apparatus that includes, *inter alia*, a radiation system, comprising a radiation source, and an illumination system that supplies a beam of radiation, an electrode, and "a voltage source connected to the radiation source and the electrode and configured to apply an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode." Koster et al. does not disclose or suggest all of the features of claim 1.

Koster et al. teaches the use of a contaminant barrier that is located between a radiation source (LA) and an illumination system (IL). *See, e.g.*, Koster et al. at FIG. 2. In the embodiment illustrated in FIG. 2, negatively charged collector plates (133) are used to attract positively charged ions and particles (150) that have been ionized by the electron source (132). *See* Koster et al. at col. 7, lns. 32-37; FIG. 2. Positively charged repeller plates (135) are provided upstream of the collector plates (133) to repel any ions or charged particles (151) that overshoot the collector plates (133). *See* Koster et al. at col. 7, lns. 38-41; FIG. 2. Voltage sources (134, 136) are provided to charge the collector plates (133) and repeller plates (135) to an appropriate potential relative to the electron source (132). *See* Koster et al. at col. 7, lns. 42-44; FIG. 2. Koster et al. does <u>not</u> disclose or suggest connecting either of the voltage sources (134, 136) to the radiation source (LA) so as to apply an electric field between the radiation source (LA) and a collector plate (133) or between the radiation source (LA) and a repeller plate (135).

Accordingly, Applicant respectfully submits that claim 1 and the claims that depend from claim 1 are patentable over Koster et al., and respectfully requests that the rejection to claims 1-7 and 9-18 be withdrawn.

Independent claim 19 recites a radiation system that includes a radiation source, an electrode, and a voltage source connected to the radiation source and the electrode. As recited by claim 19, the voltage source "applies an electric field between the radiation source and the electrode, and generates a discharge between the radiation source and the electrode to capture contaminant particles from said radiation source." Koster et al. does not disclose or suggest all of the features of claim 19.

Koster et al. is discussed above. Koster et al. simply does not disclose or suggest a radiation system that includes a voltage source that is connected to a radiation source and an electrode so as to apply an electric field between the radiation source and the electrode, as recited by claim 19.

Accordingly, Applicant respectfully submits that claim 19 and the claim that depends from claim 19 are patentable over Koster et al., and respectfully requests that the rejection to claims 19 and 20 be withdrawn.

Independent claim 21 recites a device manufacturing method using a lithographic apparatus. The method includes providing a beam of radiation with a radiation source, patterning the beam of radiation, projecting the beam of radiation onto a target portion of the substrate, providing an electrode positioned downstream, relative to a direction of propagation of the beam of radiation, of the radiation source, connecting a voltage source to the radiation source and the electrode, and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode.

Koster et al. is discussed above. Koster et al. does not disclose or suggest a device manufacturing method that includes connecting a voltage source to the radiation source and the electrode and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode.

Accordingly, Applicant respectfully submits that claim 21 and the claims that depend from claim 21 are patentable over Koster et al. and respectfully requests that the rejection to claim 21-26 be withdrawn.

Independent claim 27 recites a method for debris suppression of an ionizing radiation system. The method includes providing a radiation source, providing an electrode

downstream, relative to a direction of propagation of the beam of radiation, of the radiation source, connecting a voltage source to the radiation source and the electrode, and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode.

Koster et al. is discussed above. Koster et al. does not disclose or suggest a method for debris suppression of an ionizing radiation system that includes connecting a voltage source to the radiation source and the electrode, and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode.

Accordingly, Applicant respectfully submits that claim 27 is patentable over Koster et al. and respectfully requests that the rejection be withdrawn.

In the Office Action, claims 1-4, 7-8, 15-25, and 27-29 were rejected under 35 U.S.C. §102(e) as being anticipated by Moors et al. (U.S. Patent No. 6,781,673). Applicant respectfully traverses this rejection.

Claim 1 is discussed above. Moors et al. does not disclose or suggest all of the features of claim 1. Moors et al. discloses the use of a particle shield for shielding objects, such as a mask, from stray particles. *See* Moors et al. at Abstract. In the embodiment shown in FIG. 2, two capacitor plates (11, 12) are place perpendicular to and on either side of a mask (MA) and are oppositely charged so as to establish an electric field between them. *See* Moors et al. at col. 8, lns. 25-29; FIG. 2. Moors et al. does not disclose or suggest a lithographic projection apparatus that includes a voltage source that is connected to the radiation source and an electrode and is configured to apply an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode, as recited by claim 1.

Accordingly, Applicant respectfully submits that claim 1 and the claims that depend from claim 1 are patentable over Moors et al., and respectfully requests that the rejection to claims 1-4, 7, 8, and 15-18 be withdrawn.

Claim 19 is discussed above. Moors et al. simply does not disclose or suggest a radiation system that includes all of the features of claim 19. None of the electrodes disclosed by Moors et al. are part of the radiation system. Moreover, Moors et al. does not disclose or suggest a radiation system that includes "a voltage source connected to the radiation source and the electrode, wherein the voltage source applies an electric field between the radiation source and the electrode, and generates a discharge between the

radiation source and the electrode to capture contaminant particles from said radiation source," as recited by claim 19.

Accordingly, Applicant respectfully submits that claim 19 and the claim that depends from claim 19 are patentable over Moors et al., and respectfully requests that the rejection to claims 19 and 20 be withdrawn.

Claim 21 is discussed above. Moors et al. is also discussed above. Moors et al. simply does not disclose or suggest a device manufacturing method that includes, among other things, "connecting a voltage source to the radiation source and the electrode; and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode," as recited by claim 21.

Accordingly, Applicant respectfully submits that claim 21 and the claims that depend from claim 21 are patentable over Moors et al., and respectfully requests that the rejection to claims 21-25 be withdrawn.

Claim 27 is discussed above. Moors et al. is also discussed above. Moors et al. does not disclose or suggest a method for debris suppression of an ionizing radiation system that includes, among other things "connecting a voltage source to the radiation source and the electrode; and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode," as recited by claim 27.

Accordingly, Applicant respectfully submits that claim 27 is patentable over Moors et al., and respectfully requests that the rejection to claim 27 be withdrawn.

In the Office Action, claims 19-20, and 27 were rejected under 35 U.S.C. §102(b) as being anticipated by Silfvast et al. (U.S. Patent No. 6,232,613). Applicant respectfully traverses this rejection.

Claim 19 is discussed above. Silfvast et al. does not disclose or suggest all of the features of claim 19.

Silfvast et al. teaches an angular pumped and emitting capillary (APEC) discharge source for applications in EUV lithography, microscopy, materials processing, metrology, and resist analysis. *See* Silfvast et al. at col. 3, lns. 1-4. In an embodiment, the discharge source (100) includes metal electrodes (110, 130) at opposite ends of the discharge source (100). *See* Silfvast et al. at FIG. 2. A capillary (120) is located in between the electrodes (110, 130). *See* Silfvast et al. at FIG. 2. When voltage (V) is applied to the electrodes (110, 130), an electric field is generated within the flowing gas (G) that causes electrons to be accelerated and collide with gaseous atoms to highly excited and ionized states that radiate

the desired light. *See, e.g.,* Silfvast et al. at col. 4, lns. 26-35. Thus, the electrodes (110, 130) disclosed by Silfvast et al. are part of the discharge source (100), and the electric field that is generated is within the discharge source (100). *See* Silfvast et al. at FIG. 2.

In contrast, claim 19 recites a radiation system that includes, *inter alia*, a radiation source, an electrode, and a voltage source that is connected to the radiation source and the electrode. As recited by claim 19, the voltage source applies an electric field between the radiation source and the electrode, and generates a discharge between the radiation source and the electrode to capture contaminant particles from the radiation source.

Accordingly, Applicant respectfully submits that claim 19 and the claim that depends from claim 19 are patentable over Silfvast et al. and respectfully requests that the rejection to claim 19 be withdrawn.

Claim 27 is discussed above. Silfvast et al. is also discussed above. As discussed above, Silfvast et al. discloses arrangements of electrodes and a capillary that are within a capillary discharge source. As such, Silfvast et al. does not disclose or suggest a method for debris suppression of an ionizing radiation system that includes, among other things "providing an electrode downstream, relative to a direction of propagation of the beam of radiation, of the radiation source; connecting a voltage source to the radiation source and the electrode; and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode," as recited by claim 27.

Accordingly, Applicants respectfully submit that claim 27 is patentable over Silfvast et al., and respectfully requests that the rejection to claim 27 be withdrawn.

In the Office Action, claims 1-7, 15-22, 24, and 27-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ogushi et al. (U. S. Patent No. 6,867,843) in view of Silfvast et al. Applicant respectfully traverses this rejection.

Claim 1 is discussed above. The combination of Ogushi et al. and Silfvast et al. does not disclose or suggest all of the features of claim 1. Ogushi et al. discloses an exposure apparatus (10) that includes an EUV light source (800) and a debris removing system (100). *See* Ogushi et al. at col. 5, lns. 51-52; FIG. 1. As shown in FIG. 1, the debris removal system (100) is located downstream of the EUV light source (800). *See* Ogushi et al. at FIG. 1. In the embodiment shown in FIG. 1, the EUV light source (800) is a laser plasma light source that uses a pulse laser (804) to supply a large intensity pulse laser to a target material (803) to generate a high-temperature plasma (806) from which EUV light is emitted. *See* Ogushi et al. at col. 5, lns. 59-66; FIG. 1. In another embodiment, a Z-pinch light source, which is of a

discharge type, is used. *See* Ogushi et al. at col. 10, lns. 50-53; FIG. 7. In this embodiment, a high voltage source (410) and a capacitor (420) are used to accumulate energy such that when a switch (430) is turned on, a plasma (450) is produced in an enclosure (440) such that EUV light (250) is produced. *See* Ogushi et al. at col. 10, lns. 54-57; FIG. 7. The debris removing system is located downstream and is not connected in any way to the Z-pinch light source. *See* Ogushi et al. at FIG. 7. None of the embodiments of Ogushi et al. disclose or suggest a voltage source that is connected to the radiation source and an electrode and is configured to apply an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode, as recited by claim 1.

Silfvast et al. is discussed above. If Silfvast et al. was combined with Ogushi et al., all of the features of claim 1 would not be present, because Silfvast et al. is directed to the radiation source itself. Hence, the electrodes of Silfvast et al. are located within the radiation source such that, as discussed above, there is no voltage source that is connected to the radiation source and an electrode and is configured to apply an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode, as recited by claim 1. Hence, the combination of Ogushi et al. and Silfvast et al. does not disclose or suggest all of the features of claim 1.

Accordingly, Applicant respectfully submits that claim 1 and the claims that depend from claim 1 are patentable over the Ogushi et al. in view of Silfvast et al., and respectfully requests that the rejection to claims 1-7, and 15-18 be withdrawn.

Claim 19, Ogushi et al., and Silfvast et al. are all discussed above. The combination of Ogushi et al. in view of Silfvast et al. does not disclose or suggest all of the features of claim 19, because the combination does not disclose or suggest – at least – "a voltage source connected to the radiation source and the electrode, wherein the voltage source applies an electric field between the radiation source and the electrode, and generates a discharge between the radiation source and the electrode to capture contaminant particles from said radiation source."

Accordingly, Applicant respectfully submits that claim 19 and claim 20, which depends from claim 19, are patentable over Ogushi et al. in view of Silfvast et al., and respectfully requests that the rejection to claims 19 and 20 be withdrawn.

Claim 21, Ogushi et al., and Silfvast et al. are all discussed above. Claim 21 is patentable over Ogushi et al. in view of Silfvast et al. because the combination of Ogushi et al. and Silfvast et al. does not disclose or suggest all of the features of claim 21. Specifically,

the combination does not disclose or suggest a device manufacturing method that includes, *inter alia*, "providing an electrode positioned downstream, relative to a direction of propagation of the beam of radiation, of the radiation source; connecting a voltage source to the radiation source and the electrode; and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode," as recited by claim 21.

Accordingly, Applicant respectfully submits that claim 21 and the claims that depend from claim 21 are patentable over Ogushi et al. in view of Silfvast et al., and respectfully requests that the rejection to claims 21, 22, and 24 be withdrawn.

Claim 27, Ogushi et al., and Silfvast et al. are all discussed above. The combination of Ogushi et al. and Silfvast et al. simply does not disclose or suggest a method for debris suppression of an ionizing radiation system that includes, *inter alia*, "providing an electrode downstream, relative to a direction of propagation of the beam of radiation, of the radiation source; connecting a voltage source to the radiation source and the electrode; and applying an electric field between the radiation source and the electrode to generate a discharge between the radiation source and the electrode," as recited by claim 27.

Accordingly, Applicant respectfully submits that claim 27 is patentable over Ogushi et al. in view of Silfvast et al., and respectfully requests that the rejection to claim 27 be withdrawn.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains at issue which the Examiner feels may best be resolved through a personal or telephone interview, please contact the undersigned at the telephone number below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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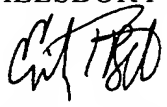

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